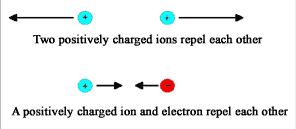
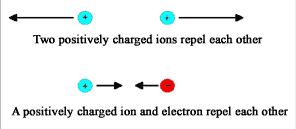
**Grade 9 Science: Electricity By: Anu Jain, Jasmine Chong, Rinkal Patel**

**Electric charge –** A negative or positive amount of electricity that builds up in an object. All atoms contain electric charges.

**Law of Electric Charges**

Like charges repel Opposite charges attract



**How do objects become charged?**

**Charging by Friction –** When two materials rub together to produce an electric charge. Materials that have a weak hold on electrons will become positively charged when they rub against materials that have a strong hold on electrons. *See Electrostatic Series*

**Electrostatic Series**

Sulphur

Brass

Copper

Ebonite

Paraffin Wax

Silk

Lead

Fur

Wool

Glass

Increasing tendency to hold on to electrons

(negatively-charged)

**Strong Hold on Electrons**

**Charging by Conduction –** When a charged object touches an uncharged object, the extra electrons in the charged object will transfer to the uncharged object.



**Weak Hold on Electrons**

**Charging by Induction –** When a charged object induces a charge on an uncharged object without physical contact.

**Insulators vs. Conductors**

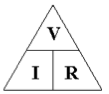
**Insulators –** Materials in which electrons do not move freely. Ex: Oil, Fur, Silk, Rubber, Wax, Plastic

**Conductors –** Materials in which electrons move freely. Ex. Silver, Copper, Gold, Aluminum, Iron, Nickel

**What is Current Electricity?**

**Current electricity –** The movement of electric charge from one place to another

|  |  |  |  |
| --- | --- | --- | --- |
| **Term** | **Definition** | **Unit** | **Measurement Device** |
| **Voltage (V)** | The electric potential per charge moving between terminals | Volts (V) | Voltmeter |
| **Current (I)** | The measure at which electric charges moves past a given point in a circuit | Amperes (A) | Ammeter |
| **Resistance (R)** | The measure of an objects opposition to the passage of a steady electric current | Ohms (Ω) | Ohmmeter |

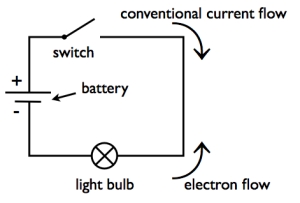
**Circuits**

**Ohm’s Law**

*“The potential difference between two points on a conductor is directly related to the electric current flowing through the conductor” –George Ohm (1789-1854)*

Potential difference = Electric current x Electrical resistance

V = I x R



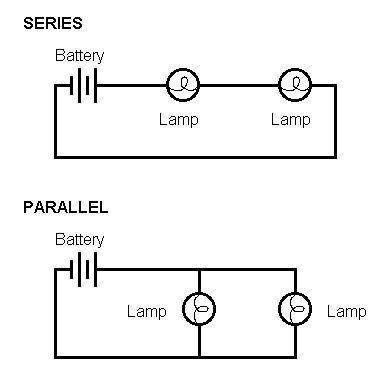
**Electric circuit –** Controlled path of flowing electricity in a complete circle

Features of an electric circuit:

1. Source – Where the electricity comes from
2. Load: Where the electrical energy is transferred and converted
3. Control: A switch that starts and stops the electricity
4. Connectors: The paths where the electricity runs

**Parallel Circuit –** Two or more paths for electric charge to follow (branches)

**Series Circuit –** One path of electric charge

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